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March 20, 1997

Mr. William F. Caton  
Acting Secretary  
Federal Communications Commission  
1919 M Street, N.W.  
Washington, DC 20554

RE: Written Ex Parte Communication:  
Federal-State Joint Board on Universal Service  
CC Docket No. 96-45

RECEIVED  
MAR 20 1997  
FEDERAL COMMUNICATIONS COMMISSION

Dear Mr. Caton:

On March 19, Paul Cain, Director - Public Policy and Government Affairs, sent, via overnight courier, the attached letter and enclosures to Tom Boasberg, Legal Advisory - Chairman Hundt. The enclosed documents generally pertain to TCG's position on Universal Service as previously expressed in the company's public filings. The meeting referenced in Mr. Cain's letter was noticed to the Commission in an ex parte filing by ALTS on March 14. An original and two copies of this letter are being submitted in accordance with Sec. 1.1206(a)(1) of the Commission's rules.

Thank you very much for your assistance in this matter.

Sincerely,

Judith E. Herrman  
Manager, Federal Regulatory Affairs

cc: Tom Boasberg

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March 19, 1997

Tom Boasberg  
Legal Advisor to Chairman Hundt  
Federal Communications Commission  
1919 M Street, NW  
Washington, DC 20554

Dear Tom,

It was a pleasure meeting with you last Thursday to discuss universal service and access charge reform. I appreciate your making time in your schedule to listen to the perspectives of facilities-based local telecommunications competitors.

After our meeting, I thought that you might find useful some additional information regarding TCG. At the risk of adding to your already long reading list, I have enclosed a package of materials that describe TCG's development from the nation's first "CAP" to the nation's largest "CLEC." The press releases and 1996 Annual Review in the right pocket will provide a good general overview of where TCG has been, where it is now, and where we expect to go. The left pocket contains reprints of news articles about the company and about TCG's President, Chairman, and CEO, Bob Annunziata.

In addition, I have included a number of TCG issue papers. As you can see, TCG has been, and remains, an active and innovative participant in the telecommunications policy debates. I am certain that you will find these papers extremely useful in your deliberations.

If I can be of any further assistance or if you have any questions regarding the issue papers, please do not hesitate to call me at (718)355-2255. I look forward to talking with you again soon.

Sincerely,

A handwritten signature in cursive script, reading "Paul E. Cain".

Paul E. Cain  
Director, Public Policy and Government Affairs

enc.

# **BEYOND COST MODELS:**

## ***Managing Interconnection Pricing to Achieve Sustainable Competition***

*Prepared for TCG by*  
**William Page Montgomery**

**February 1997**



**Teleport Communications Group**  
**One Teleport Drive, Staten Island, New York 10311**

## **The Environment**

In 1997, state regulators are likely to continue to bear the primary responsibility for setting rates for interconnection, unbundled network elements and call termination -- functions crucial to local telecommunications competition. Regardless of the resolution of the federal-state jurisdictional issues before the courts, the Federal Communication Commission's broadly articulated forward-looking cost standard or any broad "TSLRIC" specification are simply not specific enough to resolve cost disputes between incumbent local exchange carriers (ILECs) and competitive local exchange carriers (CLECs).<sup>1</sup> State regulators surely will address cost details not covered by those broader standards.

The Federal Communication Commission (FCC) adopted cost principles that are widely, perhaps universally, accepted by economists.<sup>2</sup> But principles don't produce numbers, and proper economic cost studies can be difficult to implement. All economic cost studies are, by definition, "proxies". All such studies rely upon inputs and assumptions that may not be directly verifiable using a firm's actual business records. Such studies may not incorporate all conditions relevant to the actual production function for network elements or retail services. They may not depict all financial factors that determine whether an unbundled ILEC network element or service produces satisfactory cash flows.

While all parties potentially have incentives to advocate cost study results favoring their own interests, ILECs are in the best position to leverage cost studies to their advantage. Incumbents

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<sup>1</sup> See Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96-98, First Report and Order, 11 FCC 15499, at paragraphs 674-703. The FCC's "Total Element Long Run Incremental Cost" (TELRIC) is a significant variation of the commonly accepted economic concept of "Total Service Long Run Incremental Cost" (TSLRIC). Whereas TSLRIC is the change in total forward-looking economic cost caused by providing an entire service (assuming all other services are provided as well), TELRIC is also a forward looking cost but it applies only to a single facility or component used to provide a service. Establishing TSLRIC is a more complex calculation than establishing TELRIC because costs associated with more than one service but not directly attributable to any service must be allocated among those services. Elements, on the other hand, are more discrete and should have little or no common costs associated with them. Allocation issues, therefore, are minimized or avoided entirely in the application of a TELRIC cost study.

<sup>2</sup> See Letter to Chairman Reed Hundt, Federal Communications Commission, dated Dec. 2, 1996, signed by five economists who had formerly served at the Department of Justice. *Inside Washington*, Dec. 5, 1996.

possess dramatically asymmetrical knowledge of their internal cost functions. They have the strongest the incentive to use this advantage to obtain “information rents”. Like other economic rents, information rents are gains that a firm can realize because of its position in a market. Since there is no real local exchange market, but only nascent niche competition, the “market” in this case is the regulatory environment. While regulatory rules can *prevent* rents from accruing to firms with market power, they paradoxically also can *create* avenues for such firms to exploit specialized and non-public information about their cost structures.

The primary ways that incumbents can leverage their unmatched knowledge of their costs are to misstate or misallocate the costs themselves, and to fail to impute relevant costs into their own retail services.

Another way incumbents can leverage is to repeatedly file revised cost studies with different — usually higher — results. For example, several incumbent carriers have interpreted the FCC TELRIC standard to produce much higher cost estimates than they presented in TSLRIC cost studies filed prior to the Telecommunications Act of 1996 (the Act) or the FCC’s Order setting pricing rules implementing the Act.<sup>3</sup> Frequent and time consuming cost reviews will preclude certainty in rates for competitive interconnection and unbundled network elements. CLECs need to have stable rates in order to prepare business cases to determine where, when and how to compete with incumbents; uncertainty about prices benefits only the incumbents.

The ILECs’ incentive to manipulate costs is greater under the prospect of competition than it was under monopoly, primarily because facilities-based competition, the Act’s major objective, is something they must accept but would prefer to minimize. At the same time, the consequences of costing mistakes -- which produce inefficient end user pricing -- is more severe in a potentially competitive environment than in a monopoly environment. Under a monopoly, only retail rates could be “wrong” as a result of erroneous incremental cost studies, and wrong rates could harm only the monopoly or the ratepayers. Any harm could be redressed by adjusting the monopoly’s

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<sup>3</sup> Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96-98, First Report and Order, 11 FCC 15499.

overall revenue requirement. With competition, by contrast, wrong rates charged to peer local exchange carriers can stifle their ability to compete against the incumbent's retail rates -- and consumers may be harmed by the lack of alternative service offerings without knowing that alternatives would be possible with proper costing. Since retail rates will not be set by market forces until competition is significant, the ILECs' incentive is to raise their rivals' costs while preserving their existing revenue stream by any means.

The Act permits ILECs to earn a reasonable profit on unbundled network elements that they provide to other carriers who use the elements to compete with the ILECs. Prices for ILEC network elements that are set too high may encourage entrants to direct their capital toward building the wrong elements. High prices for long-term bottleneck elements or services, most especially call termination,<sup>4</sup> also will pull CLECs' capital allocations away from facilities they could otherwise afford to build. Ultimately, the "true" market prices for network elements can be established only by competition. Until then, regulators' management of cost and pricing proceedings must walk the relatively narrow path between excessive prices for bottleneck elements and prices for potentially competitive facilities that are too low to sustain economic incentives for facilities based competition. Above all, regulators must not allow ILECs to turn cost study review into a circus of confusion.

### **Principles for Managing the Interconnection Pricing Process**

Pricing questions involving the network elements needed by competitive entrants have focused on the utility and accuracy of various proxy cost models. Usually, two models are at issue. One model, sponsored by some long distance carriers and other potential local market entrants, is a nationwide engineering analysis which is used to provide specific, local economic cost estimates for unbundled elements and other network facilities. The other model is the ILEC proxy cost study for a given state. Each of these proxy models involves many inputs and assumptions and produces a wide range of outputs.

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<sup>4</sup>See Gerald Brock, *The Economics of Interconnection*, TCG White Paper, April, 1995.

Many of the initial state regulatory proceedings, established to determine cost-based rates for network elements and interconnection, have focused on the exquisite details of the data, assumptions and internal design of the models. This type of regulatory focus can be quite useful. It is always better to compare and contrast differing sets of data and information which purport to describe the same conditions and cost elements. Two models, like two eyes or two ears, provide depth perception. But a danger exists that the regulatory proceedings can be exhausted simply by trying to analyze details, litigate differences and consider a range of largely anecdotal evidence that supports or refutes a particular model. The devil does indeed reside among the details.

In addition to analyzing the cost study information filed by any party, **state regulators must adopt strong management tools**, to ensure that interconnection pricing proceedings focus on the outcome desired: facilities-based local competition. Also, regulators should capture the kind of information that will underpin permanent interconnection prices. Regulators should be able to insulate these prices from frequent collateral attacks by a party who just happens to find new costing techniques or new data, and then seeks yet another cost review proceeding.

We classify these critical management tools as “structural” and “contextual.”

Broadly stated, structural techniques attempt to ensure that the proponent of a cost study accounts for the impacts of its cost estimates consistently in all respects. Structural approaches require that underlying cost information and cost models be evaluated *simultaneously* with appropriate pricing structures designed to recover those costs. Robust imputation tests must ensure that incumbent carriers are bound by the same cost information in their retail, and still largely monopoly, markets.

#### **Structural Techniques**

- Consider cost and pricing structures simultaneously
- Develop robust imputation of the defined costs
- Ensure that element and aggregate units of demand are provided

“Contextual” techniques specify in advance what types of basic documentation and supporting information must be filed with an incumbent’s cost study. Despite the apparently voluminous nature of some ILEC’s cost studies, analysis often shows that critical underlying demand data may

**Contextual Documentation**

- Data used to develop basic investment estimates
- Reconciliation of time estimates against actual force levels
- Reconciliation of cost estimates with demand units
- Reliance on available market

not be fully documented, and that other basic inputs such as initial investment values cannot be fully replicated from the incumbent's work papers. Some of the apparent volume of the ILEC studies consists of multiple copies of the same data.

**Structural Requirements**

Structural requirements cover simultaneous specification of price structures, imputation tests, and demand reconciliation.

***Simultaneous Specification of Price Structures***

A practice used frequently in state rate-setting proceedings requires the ILEC to file its cost information prior to any tariffs or price lists. After the cost studies have been reviewed, the incumbent is required to reflect the regulator's determinations regarding the cost studies in newly filed tariffs. The sequential approach may make sense from the perspective of the regulator's limited resources, but it can cause serious substantive problems. The better approach will require that tariffs or price lists be investigated simultaneously with the examination of the ILEC's cost studies.

The problems of the sequential approach stem from efforts to define the total service or total element incremental costs of telecommunications elements while assuming away or overlooking the effects of different production functions on costs. A production function is essentially the mix of capital, material and labor inputs used to produce a good or service. Most products can be created using different combinations of inputs, depending on resource availability and demand factors. Different tariffs or pricing structures may favor different production functions for telecommunications services facilities that provide the same *engineering* functionality. Regulatory proceedings that try to analyze telecommunications *costs* without concurrently setting *pricing structures* in place cannot fully consider these possibilities. Taking production functions into account by considering price simultaneously will encourage efficient production.



A number of states have tried to develop “consensus” costing principles prior to the submission of actual ILEC cost studies. Some of these principles are useful, but others fail to address differences in telecommunications production functions, or, worse, imply that production functions are not important. One such principle states that “Long run implies a period long enough that all costs are avoidable.”<sup>5</sup> A time period this long run brings to mind the dictum of Lord Keynes that in the long run we are all dead. At some point in time, all costs *do* become avoidable in theory, but that period is so long in the case of telecommunications networks that the time frame far exceeds any planning period that would be used by a real firm competing under real marketplace conditions.

When all costs are avoidable, any differentiation between avoided and non-avoided costs becomes spurious. Any current production function conditions are assumed away. Furthermore, treating all costs as avoidable suggests that sunk costs should not be *ignored*, but rather *re-stated* at their long-run replacement costs.<sup>6</sup> Again, this is not an assumption used by firms in effectively competitive markets. (See *Appendix*). In such markets, firms are compelled to ignore sunk costs.

The “all costs are avoidable” notion is often contradicted by other “consensus” principles. One principle states that “The technology used in the cost study should be the least cost, most efficient technology currently available, based upon the existing or planned location of switching and outside plant facilities.” The FCC adopted this latter principle in its interconnection pricing rules by allowing ILECs to assume that switching nodes reflect the same locations and sizes found in the embedded network architecture. The principle contradicts the “all costs are avoidable”

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<sup>5</sup> A number of the states have adopted similar cost principles. See Michigan PSC, “1994 Report to the Governor and the Legislature as Required by 1991 Public Act 179,” October 1993, p. 48; Utah Telecommunication Reform Law, section 54-8b-2(13); and California PUC, Decision 95-12-016, R.93-04-003 / I.93-04-002 (December 6, 1995) at Appendix C. Some of these principles were developed in order to prevent LECs from pricing specific competitive services like Centrex products at very short run marginal costs. In this context, the problems created by erring in the opposite direction, an infinitely *long* time horizon, may not have been considered.

<sup>6</sup> In contrast, the simple, straightforward definition of TSLRIC costs used by the Arizona Commission is capable of recognizing differences in production functions: “The total additional cost incurred by a telecommunications company to produce the entire quantity of a service, given that the telecommunications company already provides all of its other services. The Total Service Long Run incremental Cost is based on the least cost, most efficient technology that is *capable of being implemented at the time the decision to provide the service is made*.” (Emphasis added). Arizona Administrative Code sec. R14-2-1102(17) (June 27, 1996). . This definition is directly applicable to incumbent LECs; new entrants can price below the incumbent’s TSLRIC price. R14-2-1310(A)

principle, because the time period in which all costs were truly variable and thus avoidable would encompass actual displacement of embedded switching nodes.<sup>7</sup>

**Therefore, in state proceedings to establish permanent interconnection tariffs, prices and cost structures must be married from the outset.** The ultimate price structure should reflect the *level* of costs, but should also mirror the *structure* of the carrier's incremental costs.

### *Imputation tests*

Many states have begun to use price and cost imputation rules to ensure that an incumbent LEC's retail prices do not create a price squeeze on competitive entrants. Imputation of prices must occur for specific services where competition is possible, if bottleneck elements are used in the retail provision of the service by a competitor.

Properly designed imputation tests also can enhance the regulator's ability to manage the cost analysis and pricing process. If the incumbent LEC is required to strictly impute all costs it identifies with respect to inputs needed by its competitors, the cost study proponent loses some of its incentive and ability to make specialized assumptions about its internal use of these functions.<sup>8</sup>

For example, if the incumbent is required to reflect its estimates about physical or virtual collocation costs for competitors in the ILEC's own retail cost structure, it will be forced to deal with its potential incentives to overstate the costs necessary to serve competitors. Like most other interconnection elements, **"collocation" is largely identical to the underlying elements implicitly required even for retail monopoly services.** The floor space, structures, electrical power and most of the electronic equipment associated with collocation are the same types of

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<sup>7</sup> Many LEC TSLRIC studies use conflicting assumptions about the engineering and costs associated with switching nodes versus loop plant. The studies typically assume that new structures (poles, conduit, trenching, manholes and building wiring, for example) are placed to provide the capacity for additional access lines. Thus, while incumbent LECs may be allowed to assume replacement of all switching nodes, to serve current demand ("scorched" assumption) an opposite assumption applies to the network facilities on the customer side of these same nodes.

<sup>8</sup> In the interconnection context perhaps only permanent local number portability is a network function that does not correspond to functionalities that are required to provide services even in a sole-source, monopoly environment.

elements internal to the ILEC's own services, or, for that matter, to the same elements used by a CLEC in its own nodes or in CLEC-to-CLEC collocation.

**A robust imputation standard should include all elements used by a competitor whether or not the providing carrier “uses” the same elements itself.** Even elements that do not have a direct corresponding analog in the providing carrier's production function can nevertheless be identified and attributed this way. Because early imputation tests focused on preventing overt price squeezes, many such rules require only that the ILEC impute the costs or prices<sup>9</sup> of the components *used* in the ILEC's own retail services. This type of imputation test invites the incumbent to claim that elements used in the interconnection offering for a competitor are *not* used in the ILEC's own service.

ILEC studies, for example, use a general expense factor to recover land and building costs. The ILEC may assert that collocation charges are “different” and thus not to be imputed to the incumbent's retail rates. This assertion opens the possibility that the ILEC's substantially lower expense loading for land and building costs would not be compared to collocation — even though at a more basic level of functionality part of the collocation charge involves building costs. This condition allows an incumbent to proliferate very different assumptions about its cost structure for interconnection versus retail services.

Earlier imputation tests should be revised to address imputation of all costs that are imposed upon a CLEC, regardless of whether precisely the same functionality is specified by the ILEC for its own retail services. Some states already have adopted this broader view by rule or statute.<sup>10</sup> The imputation test also should be applied to the providing carrier's services at each level of geographic averaging used for the network components and/or retail services. Retail rates that do not pass such

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<sup>9</sup> Tariff prices or incremental costs are used depending upon whether the component is deemed to be “essential” or not.

<sup>10</sup> The Utah telecommunications reform law, for example, correctly defines the costs to be imputed with respect to the competitor, not the incumbent: “‘Essential facility or service’ means any portion, component or function of the network of service offered by a provider of local exchange service (a) that is necessary for a competitor to provide a public telecommunications service, (b) cannot be reasonably duplicated, and (c) for which there is no adequate economic alternative to the competitor in terms of quality, quantity and price.” Utah AH HB 364, section 54-8b-2(3) (1995).

a test should be allowed only where there is separate, clear evidence that the departure is warranted in order to ensure universal service in a competitively neutral manner.

### ***Demand reconciliation***

The final structural technique is to require that cost studies be fully supported by the demand estimates reflected in the cost values.<sup>11</sup> Economic costs, by definition, depend upon the output level associated with inputs. However, many cost studies do not clearly specify what demand is assumed in the calculations. Given that most unbundled elements represent functionalities that have a fairly precise analog in the provision of services absent competition, the demand sets should include both the demand expected from CLECs and the consumption of the same resources by the ILEC's own retail customers.

The demand data are necessary in order to test the effects of the cost estimates on the aggregated demand for both network elements used by competing carriers and the providing carrier's retail services that use the same elements. Therefore, the ILEC should submit its estimates of the total demand for any unbundled elements as well as the retail services that incorporate the same functionality as the element(s). The data should be separated in this manner— between demand units for the new unbundled elements and the demand for retail services — and the demand quantities should be projected over a forward looking period that represents a reasonable planning horizon (two to five years).

Such analyses are particularly important to identify the effects of demand on volume-insensitive costs, i.e., to show the unit value of volume-insensitive costs shared by the same retail and interconnection elements. Without the overall demand data, the regulator has no way to analyze whether volume-insensitive costs are allocated properly in the cost studies. Even with respect to volume-sensitive costs, the demand estimates are needed to assess whether the ILEC's studies produce aggregate volume-sensitive costs consistent with a reasonable and efficient production

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<sup>11</sup> This is also a contextual requirement; besides providing a mechanism to check the cost study proponent's own estimates, it will require the party to file supporting information (context) that often is not provided today.

function.<sup>12</sup> The aggregate demand information can be used to compute the aggregated effects of costs across the ILEC's entire demand, for each prospective unbundled element subject to a recurring rate and for each nonrecurring charge.

In addition, estimated demand for non-recurring work functions is necessary in order to reconcile work time and labor unit estimates to the entire company headcount and budget for the functions for the current operating levels.

### **Contextual Requirements**

States should use contextual checks in addition to the structural requirements regarding price structures, imputation and aggregate demand information. In managing the interconnection pricing dockets, state regulators should require proponents of different cost estimates to file adequate documentation to allow those estimates to be placed in context. Voluminous work papers that merely show the outputs of various cost model components do not in themselves provide such context. Adequate work papers should set forth *each stage* of the costing process, from the assembly of various input data to the output stage. Using specific examples, including detailed flow charts if necessary, each step of the cost modeling process should be documented and refer to the specific work papers illustrated by the examples.

Different analysts may have different opinions about which aspects of a cost study should be subject to such contextual documentation. It is certainly possible to specify very detailed requirements that could prolong the preparation of ILEC cost studies, make submissions vastly more voluminous and increase regulatory compliance costs. A more modest approach is preferable. Review of existing interconnection studies suggests a few, more limited areas that

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<sup>12</sup> One advantage of emerging competition in the local telecommunications market is that the entrants themselves will eventually have approximate data on how long service installations should take, what vendor equipment costs in the marketplace, the costs to rent basic space sufficient to install equipment, the costs for different CLECs to collocate with each other, and other useful benchmarks. While it would be inefficient for firms that are clearly price takers to attempt to formalize such information in the form of long-run economic studies, such benchmarks may be useful to determine if the incumbent carrier's cost estimates do represent efficient production techniques and free market values.

clearly require additional contextual information. These areas involve the documentation of initial investment costs assumed in studies, and various types of reconciliation reports.

In addition, state regulators should recognize that emerging competition may free them from having to rely upon cost estimates submitted by *any* interested party. We noted above that many of the telecommunications-specific network functions needed by competitive local entrants have close, if not identical, functionalities in various retail services. It is important to note, as well, that some functions are not specific to telecommunications. Cost components such as building space, construction activity, electrical equipment and power, and other items are offered today in markets that are by and large fully competitive. Individual regulatory agencies, regional groups or the NARUC can develop unbiased estimates of regional costs for these components without waiting for parties to contest each other's own cost estimates.

### ***First Cost Investment Data***

Vendor input cost data must be verifiable, without breaching legitimate business confidentiality expectations of such third parties. Every recurring cost that has investment-driven cost components should be arrayed on a separate schedule, applicable to all cost studies, identifying each place where vendor prices for component investments are used in the cost study, whether as a direct input to a study, or as an investment input to a cost model such as the Switching Cost Information System (SCIS).

This supplemental documentation should identify whether each item of vendor cost information is based upon a (a) vendor price list; (b) actual prices taken from a recent and statistically representation sample of actual payments to the ILEC's vendors; or (c) another source. The vintage of any such vendor prices, e.g., 1991, 1996, etc. should be specified as well.

The ILEC's initial cost documentation should also include another schedule showing any such initial investment inputs have been multiplied or otherwise adjusted by the use of telephone plant indices (TPIs). ILECs have traditionally used TPIs generated by Bellcore; however an increasing number appear to rely upon TPIs generated by outside consultants. Some of these TPIs are quite

inflationary, and appear to contradict evidence that telecommunications inputs prices have risen by about 2.5% less per year than inputs in the economy as a whole.<sup>13</sup> Thus, ILECs should document each step of the development of investments, separately justifying inflationary price indexes that have been applied to the investments.

### ***Other Capital Costs***

Capital carrying costs consist of economic depreciation and the cost of money. Incremental cost methods contemplate that these values will be forward-looking. Several states have allowed incremental cost studies to use capital cost inputs at or somewhat higher than current average rates applied to the ILEC as a whole. Cost studies filed by ILECs since the FCC interconnection order generally use more aggressive calculation for economic depreciation rates and costs of money.

The depreciation component of capital charges is highly controversial today. There is little dispute that new technologies will affect forward-looking capital recovery requirements. It may also be true that some plant can be shown to be functionally abandoned even if it is not yet possible to formally retire the equipment. However, sound management of the interconnection pricing cases requires that essentially subjective methods for estimating depreciation rates be rejected. Such methods cannot be contextualized — that is, there is no supplemental information than is available to document such estimates.

Plant retirement forecasting which relies upon technology substitution models and the so-called Fisher-Pry technology substitution models is characterized by significant amounts of potential subjective bias. In other words, while there are year-by-year substitution curves for different technologies, the choice of *which* curve is correct for a specific technology invites potentially highly subjective interpretations.

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<sup>13</sup> Reply Statement of Dr. John R. Norsworthy and Dr. Ernst R. Bernt, March 1, 1996, attached as Appendix B to AT&T Reply Comments, FCC Docket No. CC 94-1 Price Cap Performance Review for Local Exchange Carriers: Input prices for the non-farm business section rose at 3.01% per year from 1985 to 1994, all inputs price index for all RBOCs rose 0.22%, for an input price differential to the economy of 2.79% per year. Adjusted for telephone separations effects the 1985-94 input price differential was 2.54%. See also FCC Docket 94-1 First Report and Order, April 7, 1995, Appendix F, calculating a 2.2% input price differential.

Technology substitution forecasts also have a number of conceptual flaws. Technology substitution estimates of “economic” depreciation lives may be unrealistically low because they do not account for the fact that current telecommunications equipment can be expanded and enhanced by software and firmware upgrades. The technology is less likely than older technologies to become functionally obsolete before the reasonable end of the physical lives, when they have exceeded their ultimate capacity. The proponents of technology substitution methods have generally not demonstrated their validity using historical comparisons, which would allow substitution forecasts from several years ago to be compared *ex post facto* to actual results. Therefore, states should require ILEC contextual information showing several *previous* technology forecasts, and how these forecasts would have been reconciled with subsequent actual investment.

### ***Reconciliation Schedules***

Reconciliation schedules can help the regulator identify the overall effects of the cost proponents’s estimates. These schedules will be particularly helpful regarding estimates used to establish non-recurring costs. Such costs are developed from estimated work times associated with discrete non-recurring work functions, multiplied by the costs of various types of labor. One problem with using work time estimates to set costs is again that the data using are not aggregated or applied uniformly to all similar work functions, whether associated with activities for competitors or retail service functions.

Telephone companies maintain highly disaggregated functional accounting data that can be used for comparison of the time estimates generated by internal subject matter experts. The sum of the work time estimates and associated labor costs for both wholesale and retail services at current demand should not exceed the sum of the costs shown in the telephone companies functional accounting classifications. LECs typically do not perform such reconciliation analyses today. Requiring the carriers to place their chains of assumptions in schedules comparing the aggregated piece-part work estimates to the total available force levels would help verify the results.



## **Stabilizing Interconnection Prices After Regulatory Approval**

This paper has identified some of the tensions between (a) the near-universal recognition that rates in a competitive environment must be based upon economic costs, and (b) inherent possibilities of manipulating forward looking economic cost data. Once the state regulator has used some of the management concepts discussed above to address the immediate pricing proceedings at hand, it should ensure that competitive development of the local market is encouraged through longer-term stability in the prices it has approved. Stability is needed to enable competitors like TCG to prepare and act on business cases and to plan for extending the full benefits of competition to new retail market segments.

Stability also is needed to ensure that scarce regulatory resources are focused on consumer protection and encouraging efficient competition, rather than being wasted as competing parties try to use regulatory process to gain advantages they cannot win in the marketplace. In other words, placing stabilized caps on the prices for interconnection elements is an important way to ensure that various competing carriers bargain with each other on more equal terms. More equal bargaining power based upon limits on unpredictable price increases may well hasten the day when inter-carrier negotiations can fully displace complex regulatory proceedings.

Price stability should be ensured by capping the individual interconnection rates, while allowing carriers some freedom to bargain for any prices below the caps. Prices should be bounded at the lower end by the Telecommunications Act's prohibitions against discrimination (both among CLECs and within the operations of an incumbent) and changes in economic costs, which likely will decline over time. This approach differs somewhat from the "price cap" plans recently applied to set limits on categories or service baskets of incumbent LECs. These price cap plans have proved to be nearly as complicated to implement as traditional rate setting. These plans seek to ensure by means of regulatory design that prospective cost saving and productivity gain are reflected in the retail service price indexes. However, caps on interconnection prices or unbundled element prices will not require such convoluted formulations. Emerging competitive forces should be allowed to operate on future price levels without intensive regulatory design efforts.

## **Conclusion**

State regulators are in a position to define important pricing rules that will allow facilities-based local competition to develop over the next few years. While economic costs must be the basis for interconnection pricing if economically efficient local competition is to develop, incremental costs are, by definition, difficult to estimate correctly. Various cost models now under discussion may aid this process. But state regulators must look beyond cost models and develop other techniques for managing the costing process until effective competition creates incentives for efficient costing and non-discriminatory pricing by ILECs. Both structural and contextual techniques will enhance management of the process, and both should be adopted by state regulators.

## **Appendix**

### ***Matching Price Structure to Costs***

Consider a firm operating in a fully competitive market, which must make pricing decisions to engage in competitive bidding for customers' business. The firm has some sunk costs, in the form of productive capacity which is sufficient to satisfy customer demand up to some defined level of output. The firm's capacity also enables it to actively compete in some geographic or product market, but not in others. It can serve higher levels of demand or different market segments only by adding new capacity.

In setting prices, a firm has two broad options. First, it could price all output as if no cost were sunk, establishing one price for the product regardless of how market demand affects its existing cost structure. In effect, its potential capacity limitations are imputed to all levels of output; its pricing structure ignores the possibility that the firm might actually have to add capacity to serve certain demands.

However, this option would not properly differentiate prices to recognize actual demand conditions, and the effects of different demands on the firm's costs. In a competitive market this firm likely will lose business to a second firm that is willing to exclude some of its sunk costs in setting customer prices, other things being equal. *Unless* the first firm holds significant market power or operates in a market that is not yet effectively competitive, it will lose share to the second firm.

In a competitive market each firm must be ready to establish multi-part pricing structures, designed to recover **no more than the firm's economic or incremental costs**, depending upon whether the level of demand requires only the use of production capacity that represents sunk costs, or whether it must add new resources to meet higher levels of demand.

Recovery of non-production costs — including the second firm's joint costs — would be achieved by market-directed price-setting throughout the firm's product lines. This would not disturb the balance achieved by the basic pricing structure. If new capacity is required, for example, the firm may seek a higher return on investment, or ensure that the customers who require new capacity, or want to purchase multiple products, make contracts that more completely guarantee recovery of the firm's joint costs.

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# *Universal Service Assurance II:*

## **A Blueprint for Action**

*November 1994*

**TCG**

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## **Introduction**

As the local telecommunications industry in the United States makes the transition from monopoly to competition, it is imperative to preserve the national commitment to affordable universal service. TCG has proposed an approach to universal service that marries universal service funding and local exchange competition. As outlined in TCG's first universal service paper (See, *Universal Service Assurance: A Concept for Fair Contribution and Equal Access to Subsidies*, December 1993; hereafter, USA I), Universal Service Assurance (USA) would replace the current complex system of implicit and explicit intercarrier and intracarrier subsidies with a single, explicit, carrier-neutral support program for individual consumers funded by all telecommunications common carriers. "Equal Access" by all telecommunications carriers to the support program links competition to universal service. By allowing consumers to select any local carrier and still obtain whatever subsidy to which they are entitled, USA makes all consumers "good" customers and encourages many local exchange carriers to compete to attract all customers. USA eliminates marketplace distortions resulting from intercarrier and intracarrier cross subsidies, and assures a flow of subsidies adequate to support basic service. Incumbent carriers that face competition in selected market segments will still be able to serve any subsidized consumer at no more than existing rates and without loss of revenues from those customers. They will be free to lower their prices in competitive markets without endangering support for basic telephone service, and thus will bolster their position in those markets. The fundamental concept of a provider-neutral, carrier-funded universal service fund to

which all telecommunications common carriers contribute and from which any carrier providing "universal service" may withdraw has been endorsed with minor variations by many other parties in many forums. Even more telling, key elements of the concept have been enacted into law:

- The state of Vermont recently enacted legislation establishing an independent subsidy fund and allowing subsidized customers to choose a carrier other than their incumbent local exchange carrier (LEC) for their local service.<sup>1</sup>
- The state legislature of Connecticut has also made it legal for consumers to apply their Lifeline subsidies to the carrier of their choice.<sup>2</sup> That same legislation authorizes the Connecticut Department of Public Utility Control to establish an independent fund to support the provision of basic service by any company.

At its 1994 Summer meetings, the National Association of Regulatory Utility Commissioners (NARUC) adopted a resolution calling for the study of plans "... completely revamping the separations/cost allocations processes in order to make implicit subsidies explicit, or any other system that would be more harmonious with a competitive market structure."<sup>3</sup>

The Federal Communications Commission recently issued a Notice of Inquiry to evaluate the Federal Universal Service Fund for high-cost areas. This inquiry seeks comments on cost issues and on the use of customer vouchers that would afford customers in high-cost areas a choice of carriers.

The National Telecommunications and Information Administration (NTIA) has also requested comments on services to be included in the definition of Universal Service and on mechanisms for assuring fair access to the "Information Superhighway."

It is likely that more states, and the federal government, will enact additional legislation or implement new policies that embrace the basic principles of USA. To encourage such action, TCG offers this blueprint for implementation.

**Universal Service  
Assurance: Nationwide  
or Statewide?**

USA is designed for initial implementation at the state level, for two reasons. First, the situation in one state will differ substantially from that in another: the incumbent local exchange carrier may be "better" or "worse," making a state less or more attractive to competitive LECs, and the height of the operational, legal, and economic barriers to local competition will vary greatly. Efficiency might be better served, therefore, if states are allowed to experiment with the program, adjusting it to suit their specific situations and needs. Wider experimentation would also allow



states to learn from each other to determine which program would work best under particular circumstances.

Second, every state would have to have pro-competition policies in place before a USA program could be implemented as a national policy. States that are already adopting policies favoring local competition should not have to wait for other states or the federal government to act before resolving these issues themselves.

Even so, a nationwide USA can only work to its highest potential after every state has opened its entire local telecommunications market to competition. Otherwise, consumers and competitive LECs in one state may end up subsidizing a protected monopoly in another state, with no opportunity to challenge the monopoly and no guarantee that state-to-state subsidies would be minimized. Subsidizing a protected monopoly would undermine the inherent fairness of USA. Thus, while TCG supports and encourages state experimentation, the goal remains a common, national USA program.

Depending on the jurisdictions in which it is implemented, USA would (and should) replace nearly all existing universal service support programs. A national USA would replace all federal support programs, including the high-cost fund, the Lifeline and Link-up America programs, as well as any internal intra-state subsidies by the local exchange carriers. (See Appendix B for description of federal programs.) A state USA would provide funding for state matching support of federal programs,